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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte AKIRA KURAMORI and MITSURU NAITO

Appeal 2008-4641
Application 10/531,374
Technology Center 3600

Decided: October 31, 2008

Before JENNIFER D. BAHR, LINDA E. HORNER, and STEFAN STAICOVICI *Administrative Patent Judges.*

STAICOVICI, *Administrative Patent Judge.*

DECISION ON APPEAL

STATEMENT OF THE CASE

Akira Kuramori et al. (Appellants) appeal under 35 U.S.C. § 134 from the Examiner's decision rejecting claim 1. Claims 2 through 6 have been canceled. We have jurisdiction over this appeal under 35 U.S.C. § 6 (2002).

THE INVENTION

The Appellants' invention is drawn towards a tire wheel assembly for enabling run-flat driving including a pneumatic tire 2, a wheel rim 1, and a run-flat support 3 (¶¶ 1 and 13 and fig. 1). The run-flat support 3 includes a metallic annular shell 4 having a yield strength of 400 MPa or more (¶¶ 14 and 16) and elastic rings 5 having a JIS-A hardness of 50 to 65 (¶¶ 14 and 24). Furthermore, the annular shell 4 includes a continuous support structure 4a and leg parts 4b (¶ 15 and fig. 2). In use, when the pneumatic tire 2 goes flat while the vehicle is being driven, the flat pneumatic tire 2 is supported by the support surface 4a of the shell, thereby enabling run-flat driving of the vehicle (¶ 20). The run-flat support 3 satisfies the relation of (W2-W1)/W1 = 0.015-0.100 (¶ 21), where W1is the distance between points 5a of the run-flat support 3 when the run-flat support 3 is mounted on the wheel rim 1 (fig. 1) and W2 is the distance between points 5a and of the run-flat support 3 when the run-flat support 3 is free (not mounted) (fig. 2).

Claim 1, the sole claim in the instant appeal, reads as follows:

1. A tire wheel assembly in which a pneumatic tire is fitted to a rim of a wheel and a run-flat support is inserted in a cavity section of the pneumatic tire, the run-flat support including an annular shell and a pair of left and right elastic rings, the annular shell having a support surface projecting to the outer circumferential side and leg parts extending along both sides of the support surface, and the elastic rings supporting the leg parts of the annular shell on the rim,

   wherein a relation (W2-W1)/W1 = 0.02 to 0.100 is satisfied assuming that W1 is an interval between abutting points where the pair of left and right elastic

rings abut on the inner surface of the tire when the pneumatic tire and the run-flat support are mounted on the rim and W2 is an interval between the abutting points when the run-flat support is not mounted;

wherein a JIS-A hardness of the elastic rings is 50 to 65; and

wherein the annular shell is composed of metal with a yield strength of 400 MPa or more.

THE REJECTIONS

The Examiner relies upon the following as evidence of unpatentability:

Payne	US 4,823,854	Apr. 25, 1989
Hellweg	US 6,463,974 B1	Oct. 15, 2002
Boiocchi	US 7,100,654 B2	Sep. 5, 2006

The Appellants seek review of the Examiner's rejection of claim 1 under 35 U.S.C. § 103(a) as unpatentable over Hellweg in view of Payne and further in view of Boiocchi.

FINDINGS OF FACT

Hellweg

We make the following findings of fact with respect to Hellweg:

1. Hellweg discloses a vehicle wheel 1 including a pneumatic tire 34, a center rim 8 (wheel rim), and an emergency running support body 2 (run-flat support) having a shell-shaped ring body 3 and support elements 4, 5 (col. 8, ll. 61-67 and fig. 1).

2. In mounting, the emergency running support body 2 is compressed and then released within the tire cavity (col. 5, ll. 19-26 and col. 9, ll. 24-38 and fig. 2).

3. The elasticity of the ring-shaped support elements can be adjusted to necessary requirements for mounting of the run-flat insert (col. 4, ll. 52-57).

4. The shell-shaped ring body 3 is made from steel, aluminum, or reinforced plastics, which are selected depending on the forces acting under emergency running conditions (col. 8, ll. 24-30).

Payne

We make the following findings of fact with respect to Payne:

5. Payne discloses a wheel assembly 10 including a pneumatic tire 12, a rim segment 16, and a safety insert 14 (col. 4, ll. 36-44 and fig. 1).

6. The safety insert 14 is made from steel or aluminum that is selected to allow the insert 14 to be compressed to fit in the wheel assembly 10 (col. 8, ll. 51-65).

7. Upon mounting the safety insert 14 within the wheel assembly 10 the axial width dimension of the insert 14 is reduced from the free-state dimension of 7.08 inches (W2) to a deflected dimension of 6.96 inches (W1) (col. 13, ll. 27-55 and fig. 11).

8. When inserting the free-state dimension of 7.08 inches (W2) and the deflected dimension of 6.96 inches (W1) into the relationship (W2-W1)/W1 the result equals 0.0172.

9. In mounting, the safety insert 14 is compressed and then released within the tire cavity (col. 8, ll. 55-58).

Boiocchi

We make the following findings of fact with respect to Boiocchi:

9. Boiocchi discloses a wheel assembly including a pneumatic tire 3, a rim 2, and a support 1 (col. 7, ll. 4-7 and fig. 1).

10. The support 1 includes an annular body 5 made of spring steel having a yield strength between 1200 and 1300 N/mm^2 (1200-1300 MPa) (col. 7, ll. 60-63).

ISSUES

The issues before us are whether the Appellants have demonstrated that the Examiner erred in determining that the subject matter of claim 1 is unpatentable over Hellweg in view of Payne and further in view of Boiocchi. These issues turn on whether: (1) the combination proposed by the Examiner renders obvious a tire wheel assembly in which the claimed relationship (W2-W1)/W1 = 0.02-0.1 is satisfied; (2) whether the combination proposed by the Examiner discloses a metal annular shell composed of a metal having a yield strength of 400 MPa or more; and (3) whether the teachings of Hellweg and Payne are combinable.

OPINION

Issue (1)

With respect to the first issue, the Appellants argue that the proposed combination by the Examiner fails to disclose the claimed relationship of (W2-W1)/W1 = 0.02-0.1 because (i) the asserted relationship of (W2-W1)/W1 in the flat-run insert of Payne is equal to 0.0172 which falls outside

the claimed range of 0.02-0.1 (App. Br.[1] 10) and (ii) the structure of the run-flat safety insert of Payne is so different than the structure of the run-flat insert of Hellweg that any dimensional relationship taught by the insert of Payne is irrelevant when applied to the insert of Hellweg (App. Br. 11-12).

With respect to the Appellants' first point we agree with the Appellants that the value of the relationship (W2-W1)/W1 of 0.0172, as taught by Payne, does not fall within the claimed range of 0.02-0.1. However, we agree with the Examiner that the value of 0.0172 is so close to the claimed range of 0.02-0.1 that a person of ordinary skill in the art would have expected the relationship (W2-W1)/W1=0.0172 to have the same properties as the claimed relationship (W2-W1)/W1=0.02-0.1 (Ans. 8). When the difference between the claimed invention and the prior art is the range or value of a particular variable, then a prima facie rejection is properly established when the difference in range or value is minor. *See Haynes Int'l, Inc. v. Jessop Steel Co.,* 8 F.3d 1573, 1577 n.3 (Fed. Cir. 1993) (citing *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 783 (Fed. Cir. 1985)).[2] Furthermore, the claimed range of the relationship (W2-W1)/W1 was amended during prosecution of the instant application from 0.015-0.1 to 0.02-0.1 (Amendment filed April 2, 2007 at 5). In contrast to the Specification which discusses the criticality of the end points of the

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[1] We refer herein to the Appeal Brief ("App. Br."), filed November 21, 2007, the Reply Brief ("Reply Br."), filed April 1, 2008, and the Examiner's Answer ("Ans."), mailed January 24, 2008.

[2] The Court held as proper a rejection of a claim directed to an alloy "having 0.8% nickel, 0.3% molybdenum, up to 0.1% iron, balance titanium" as obvious over a reference disclosing alloys of 0.75% nickel, 0.25% molybdenum, balance titanium and 0.94% nickel, 0.31% molybdenum, balance titanium.

originally claimed range, 0.015 and 0.1 (Spec. 7, ll. 13-16), the prosecution record does not provide us with any indication as to the criticality of the newly amended end point 0.02. When an applicant seeks to overcome a prima facie case of obviousness by showing improved performance in a range that is within or overlaps with a range disclosed in the prior art, the applicant must "show that the [claimed] range is *critical,* generally by showing that the claimed range achieves unexpected results relative to the prior art range." *In re Woodruff,* 919 F.2d 1575, 1578 (Fed. Cir. 1990). The Appellants have not provided such a showing. Therefore, in the absence of any objective evidence showing the criticality of the end point 0.02, we agree with the Examiner that "one of ordinary skill in the art would have expected a run-flat with the relationship (W2-W1)/W1 = 0.0172 as taught by Payne et al. to have the same properties as a run flat with the claimed relationship (W2-W1)/W1 = 0.02-0.1" (Ans. 9).

In regard to the Appellants' second point, at the outset, we note the similarity between Figure 1 of Hellweg and Figure 1 of Payne. Both Hellweg and Payne disclose a wheel assembly including a pneumatic tire and a run-flat insert for allowing run-flat driving (Findings of Fact 1 and 5). Both Hellweg and Payne disclose mounting the run-flat insert by axially compressing the run-flat insert at the abutting ends and releasing it within the tire cavity (Findings of Fact 2 and 9). Both Hellweg and Payne disclose using a steel or aluminum material to manufacture the run-flat insert (Findings of Fact 4 and 6). Therefore, in contrast to the Appellants' contention, we find that both Hellweg and Payne disclose run-flat inserts having similar structures and functions. However, Hellweg does not indicate quantitatively the amount of axial compression required to mount

the run-flat insert. When the run-flat insert of Payne is mounted the axial width dimension is reduced from the free-state dimension of 7.08 inches (W2) to a deflected dimension of 6.96 inches (W1) (Finding of Fact 7), which represents a compression ratio (W2-W1)/W1 of 0.0172 (Finding of Fact 8). In view of the small difference between the value of the compression ratio (W2-W1)/W1 of Payne and the claimed range, and the structural and functional similarities of the run-flat inserts of Hellweg and Payne, a person of ordinary skill in the art would have readily appreciated that a ratio (W2-W1)/W1 of 0.0172, as taught by Payne, would likewise provide a predictable level of axial compression to mount the run-flat insert of Hellweg. After all, "[a] person of ordinary skill is also a person of ordinary creativity, not an automaton." *KSR Int'l. Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1742 (2007).

Lastly, the Appellants argue that "it is improper to import the widths (mounted and un-mounted) from Payne et al. into the device of Hellweg et al." because neither Hellweg nor Payne disclose "that the same materials were used, or that the materials had the same elasticity, or that the materials have the same thickness" (App. Br. 12). The run-flat inserts are mounted by axially compressing the run-flat insert at the abutting ends and releasing it within the tire cavity (Findings of Fact 2 and 9). When the run-flat insert is released within the tire cavity an elastic restoring force is produced which maintains the run-flat insert within the tire cavity. Hence, although Appellants correctly note the lack of identity of structure between the run-flat insert of Hellweg and the run-flat insert of Payne, we nonetheless find that the selection of a suitable insert thickness, a type of material, and a compression ratio to obtain a desired elastic restoring force involves only

routine optimization on the part of a person of ordinary skill in the art. This accords with the general rule that discovery of an optimum value of a result effective variable (in this case, the optimum elastic restoring force) is ordinarily within the skill of the art. *See In re Boesch*, 617 F.2d 272, 276 (CCPA 1980). The similarities in function and structure between the run-flat inserts of Hellweg and Payne, as discussed above, provide a reasonable basis for a person of ordinary skill in the art to predict that a compression ratio in the vicinity of the ratio taught by Payne would achieve a desired elastic restoring force in the run-flat insert of Hellweg. The Appellants have not provided any objective evidence that one ordinarily skilled in the art would not achieve a desired elastic restoring force in the run-flat insert of Hellweg using a compression ratio within the claimed range. The arguments of counsel cannot take the place of evidence in the record. *In re Schulze*, 346 F.2d 600, 602 (CCPA 1965).

Issue (2)

With respect to the second issue the Appellants take the position that because the "annular body of Boiocchi et al. is not equivalent to the annular shell 3 of Hellweg et al.... one of ordinary skill in the art would not have used []its material and yield strength[] to modify shell 3 of Hellweg et al." (App. Br. 17-18). We disagree. Hellweg specifically teaches a run-flat support including a shell-shaped ring body 3 that is made from steel, aluminum, or reinforced plastics, which are selected depending on the forces acting under emergency running conditions (Finding of Fact 4). Similarly, Boiocchi discloses a support body having an annular body 5 made of spring steel having a yield strength between 1200 and 1300 N/mm^2 (1200-1300

MPa) (Findings of Fact 9 and 10). Hence, both Hellweg and Boiocchi disclose a steel run-flat insert and Boiocchi specifically discloses spring steel having yield strength between 1200 and 1300 N/mm^2 (1200-1300 MPa). A person of ordinary skill in the art would have been prompted to use the spring steel of Boiocchi to make the run-flat support of Hellweg because the run-flat inserts of both Hellweg and Boiocchi are designed for a similar intended use and as such require similar material characteristics to support a similar loading.

Issue (3)

Finally, regarding the third issue in this appeal, the Appellants appear to argue that because the run-flat insert of Payne is used in a wheel assembly having a segmented rim, the teachings of Payne are not combinable with the teachings of Hellweg of a wheel assembly having a one-piece rim (App. Br. 19). In other words, the Appellants appear to argue that because Payne teaches a run-flat support mounted on a segmented rim, the teachings of Payne are not combinable with the teachings of Hellweg which are drawn to a one-piece rim. This argument is not persuasive. "When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability." *KSR*, 127 S.Ct. at 1740. As discussed above, the Examiner reasons that such a combination would have been obvious to provide the compression ratio of Payne to the run-flat insert of Hellweg to obtain a desired compression (elastic restoring force) that prevents the tire bead from being unseated (Final Rejection, mailed May 15, 2007, at 3). The

Appellants have not explained why any differences in the one-piece rim and the segmented rim of Hellweg and Payne, respectively, are of such a nature as to have dissuaded a person of ordinary skill in the art at the time of Appellants' invention from utilizing the compression ratio (W2-W1)/W1 of 0.0172 of Payne to obtain a desired compression (elastic restoring force), as reasoned by the Examiner. As shown above, both Hellweg and Payne disclose run-flat inserts having similar structures and functions.

For the foregoing reasons, the Appellants' arguments do not persuade us that the Examiner erred in rejecting claim 1 as unpatentable over Hellweg in view of Payne and further in view of Boiocchi. Accordingly, the rejection of claim 1 is sustained.

DECISION

The decision of the Examiner to reject claim 1 under 35 U.S.C. § 103(a) as unpatentable over Hellweg in view of Payne and further in view of Boiocchi is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.136(a)(1)(iv) (2007).

AFFIRMED

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